

REMARKS

This is in response to the Office Action mailed August 26, 2004 and to the Supplemental Office Action mailed September 14, 2004, in which claims 1-24 were rejected. With this amendment, Applicants have modified claims 1, 10, 20, and 21, and added new claim 25. Entrance of the amendments and reconsideration of the application as amended is respectfully requested.

EXAMINER INTERVIEW SUMMARIES

Applicants' representative, Brian D. Kaul, had telephone interviews with the Examiner David D. Davis on September 13, 2004, September 15, 2004, and September 24, 2004. During the first two interviews, Applicants described the invention, the differences between the invention and the prior art (the cited Applicants' Admitted Prior Art - FIG. 2, and Lairson et al. - U.S. Patent No. 5,822,153), and the particular language used in the claims that Applicants believe sufficiently distinguishes the invention from the prior art. Although the Examiner indicated that he was sufficiently persuaded that at least independent claims 1 and 10 were allowable in view of the cited prior art, the Examiner indicated that he would need to conduct another review of the related references prior to making a final determination as to the allowability of the claims.

In an effort to expedite the prosecution of the present application, Applicants submitted a proposed amendment in accordance with the first two interviews on September 15, 2004.

On September 24, 2004, the undersigned attorney contacted the Examiner in response to a voicemail message left by the Examiner. The Examiner explained that the proposed amendment would not place the application in condition for allowance in

view of Chang et al. (U.S. Patent No. 6,069,775). As a result, a resolution of the case was not reached.

CLAIM REJECTIONS - 35 U.S.C. §103

In the Office Action, The Examiner rejected claims 1-24 under 35 U.S.C. §103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) as shown in FIG. 2 and described on pages 5-10 in view of Lairson et al. (U.S. Patent No. 5,822,153).

As explained in Applicants' response to the Office Action mailed March 24, 2004 and during the interviews with Examiner Davis of September 13, 2004 and September 15, 2004, independent claims 1, 10, 14, and 20 are neither taught nor suggested by the cited prior art. In general, none of the cited references disclose a perpendicular writing element that includes a main pole having a main pole tip and a return pole having a return pole tip that is located downstream of the main pole relative to a moving magnetic medium.

More particularly, Applicants disagree with the Examiner's continued finding that FIG. 2 of the cited AAPA shows a perpendicular writing element 134 "having a return pole tip, located downstream of pole 144 [main pole] relative to the rotating disc 102." As explained in Applicants' Responses to the Office Actions mailed June 19, 2003 and March 24, 2004, the cited AAPA only shows a return pole tip that is located upstream of the main pole. As presently stated in the specification, arrow 172 represents the direction of movement of the magnetic medium (disc 102) relative to head 130. Therefore, the downstream direction relative to the disc 102 is the same direction as that indicated by arrow 172. Accordingly, return pole 140 is located upstream of main pole 144 relative to the moving magnetic medium. Furthermore, the read element 138, shown in FIG. 2 of the cited AAPA, is located upstream of the writing element rather than downstream as indicated by the Examiner in the first paragraph of Page 3 of the

Office Action mailed September 14, 2004.

Applicants also disagree with the Examiner's repeated finding that "Lairson et al shows in figure 3 head 69 including perpendicular writing element 75 including a main pole 84 having a main pole tip and a return pole 88 having a return pole tip located downstream of pole 84 relative to rotating disc 41." In particular, Lairson et al. only describe the head 69 depicted in FIG. 3 as being "formed of a pair of pole tips 82 and 84 which are separated by an [sic.] a magnetic gap 86, the pole tips acting as terminals of magnetically permeable yoke layers 88 and 90 which form a write circuit which is activated by an electrical current and coil layer 93." See Col. 5, lines 26-44 of Lairson et al. Accordingly, Lairson et al. provide no basis for the Examiner's finding that the cited pole tip 84 operates as a main pole. Furthermore, there is no disclosure in Lairson et al. of an upstream or downstream direction, relative to a moving magnetic medium, for the head 69 shown in FIG. 3. Therefore, there is no basis for the Examiner's finding of the particular relative locations of the cited main and return poles.

Applicants further disagree with the Examiner's finding that Lairson et al. "shows in figure 2 a perpendicular read element upstream element 75 that includes top shield 77 and bottom shield 80 upstream of shield 77." Applicants assume that the Examiner intended to cite FIG. 3 of Lairson et al. As mentioned above, Lairson et al. fail to disclose an upstream or downstream direction relative to a moving magnetic medium for the head 69 shown in FIG. 3. Therefore, there is no basis for the Examiner's finding of the particular location of the read element relative to the writing element and the moving magnetic medium.

Additionally, the Examiner's position that the direction of flow of the magnetic flux determines which pole operates as a "main pole" and which operates as a "return pole" is false. See Page 4, last paragraph. Rather, the direction of flow of the

magnetic flux has no bearing on whether a pole operates as a "main" pole, or as a "return" or "non-writing" pole. Instead, perpendicular data recording operations always occur at the main pole regardless of the direction of flow of the magnetic flux. In fact, perpendicular data recording requires rapid changes in the direction of flow of the magnetic flux in order to record the magnetic bits (logic 1's and 0's). For perpendicular writing, the direction of flow of the magnetic flux through the main pole tip determines whether a magnetic region (See regions 162 in FIG. 2), which represents a bit of data, has an upward orientation (e.g., representing a logic 0) where the magnetic domain points from the magnetic medium to the main pole tip, or a downward orientation (e.g., representing a logic 1) where the magnetic domain points from the main pole tip toward the magnetic medium. The return pole, as explained in the present application, includes a pole tip that has a magnetic medium facing surface area that is many times larger than that of the main pole tip in order to prevent data recording at the return pole tip. Accordingly, the main pole remains the main pole regardless of the direction of flow of the magnetic flux, since it is always the pole that is responsible for writing data to the magnetic medium. Additionally, the return pole remains a "non-writing" pole regardless of the direction of flow of the magnetic flux.

For the reasons set forth above, even if sufficient motivation to combine the cited prior art existed, which Applicants do not concede, their combination would not form the present invention described in independent claims 1, 10, 14, or 20. Therefore, Applicants submit that independent claims 1, 10, 14, and 20 are non-obvious in view of the cited prior art, and requests that the rejections be withdrawn. Additionally, Applicants submit that claims 2-9, 11-13, 15-19, and 21-24 are allowable as being dependent from allowable base claims, and requests that the rejections be withdrawn. Finally, Applicants

submit that claim 25 is allowable as being dependent from allowable base claim 10.

REQUEST FOR COMPLETE RESPONSE

Applicants further point out that the above-rejections are identical to those presented in the Office Action of March 24, 2004, except for the addition of the rejections of new claims 20-24 provided in the Supplemental Office Action of September 14, 2004. However, as mentioned above, Applicants have previously addressed each of the rejections and has clearly pointed out their flaws. Even so, the Examiner has failed to address Applicants' previous arguments, and only responds by stating that they were "moot in view of the new grounds(s) of rejection." Applicants request that the Examiner fully respond to all of the arguments presented above by explaining why they are, or are not, persuasive in order to move prosecution of this case along. Should the Examiner have questions regarding any of the arguments presented by Applicants, the Examiner is encouraged to contact the undersigned representative of Applicants for a telephone interview.

CHANG ET AL. (U.S. Patent No. 6,069,775)

As mentioned above, the Examiner indicated during an interview that the claims do not appear to be in condition for allowance in view of Chang et al. Applicants respectfully disagree because, as understood by those skilled in the art and explained below, longitudinal writing elements are substantially different than perpendicular writing elements, to which the present invention is directed. Applicants believe that the substantial differences render longitudinal writing elements non-material to the patentability of the perpendicular writing element of the present invention.

Longitudinal writing elements are configured to record magnetic patterns to the magnetic medium using two poles (i.e., writing poles). The longitudinal magnetic patterns recorded by such longitudinal writing elements are oriented substantially parallel to the magnetic medium facing surfaces (i.e., the pole tips) of the writing poles. The magnetic flux signals used to record the longitudinal magnetic patterns fringe across a gap between the writing poles and orient each magnetic region of the magnetic medium such that its magnetic domain points toward one of the writing poles or the other.

Perpendicular writing elements, on the other hand, are configured to record magnetic patterns to the magnetic medium only at a single writing pole (i.e., a main pole) and the magnetic patterns are oriented substantially perpendicular to the pole tip of the main pole. Perpendicular writing elements also include a relatively large return pole that forms a component of the magnetic circuit of the perpendicular writing element, but the magnetic flux received or emitted from the pole tip of the return pole does not perform a data recording function (i.e., it is a "non-writing" pole). As a result, longitudinal writing elements lack the main and return pole configuration of perpendicular writing elements, and do not operate to record magnetic patterns to the magnetic medium that are oriented substantially perpendicular to the pole tip of either of the writing poles.

Chang et al. relates to longitudinal writing elements rather than perpendicular writing elements. For instance, in the head 200 of Chang et al. "[m]agnetic field signals fringe across the disc gap layer 222 between the top first pole tip 246 and the second pole tip 258 to write magnetic information signals into a rotating magnetic disc." [Column 12, lines 28-34] Thus, the poles 246 and 258 form the writing poles of a longitudinal writing element rather than a perpendicular writing element. Similarly,

the writing element of FIG. 19 is also a longitudinal writing element wherein magnetic field signals fringe across the gap between a first pole tip layer 318 and a second pole tip layer 342 to record longitudinally oriented magnetic patterns to the magnetic disc. [Column 13, line 66 through column 14, line 17]. Accordingly, the longitudinal writing elements of Chang et al. lack the claimed return pole of the perpendicular writing element of the present invention. Therefore, the present invention is novel in view of Chang et al.

Additional substantial differences exist between the longitudinal writing elements of Chang et al. and the perpendicular writing element of the present invention. In particular, the longitudinal writing elements of Chang et al. provide a substantially different function in that they record magnetic patterns to the magnetic medium that are oriented substantially parallel to the magnetic medium facing surfaces of the writing poles (i.e., 246 and 258; 318 and 342), whereas the perpendicular writing element of the present invention records magnetic patterns to the magnetic medium that are oriented substantially perpendicularly to the magnetic medium facing surface of the main or writing pole tip. Additionally, the longitudinal writing elements of Chang et al. operate to record magnetic patterns in a substantially different manner. For instance, the longitudinal writing element of Chang et al. utilize two writing or main poles (246 and 258; 318 and 342) to record the longitudinally oriented magnetic patterns to the magnetic medium, whereas the present invention utilizes a single writing or main pole to record the perpendicularly oriented magnetic patterns to the magnetic medium. Finally, the longitudinal writing elements of Chang et al. operate to provide a substantially different result than the perpendicular writing element of the present invention because the magnetic patterns recorded to the magnetic medium by the longitudinal writing

element of Chang et al. have a substantially different orientation than those recorded by the perpendicular writing element of the present invention.

Furthermore, Applicants submit that the present invention is non-obvious in view of Chang et al. since there is no motivation to modify the longitudinal writing element of Chang et al. into a perpendicular writing element. First, such a change would render the writing element of Chang et al. unsuitable for its intended purpose of writing longitudinally oriented magnetic patterns to the magnetic medium. See MPEP §2143.01; *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959); and *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.). Therefore, Applicants submit that the present invention is non-obvious in view of Chang et al. and other longitudinal writing elements.

CONCLUSION

In view of the above comments and remarks, Applicants respectfully believe that the present application is in condition for allowance. Reconsideration and favorable action is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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